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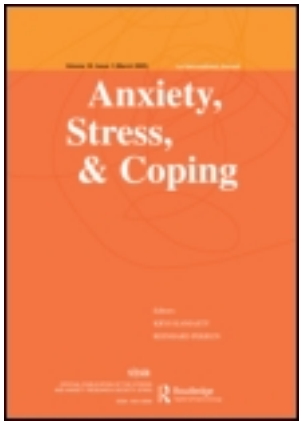

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Workplace bullying and its relation with work characteristics, personality, and post-traumatic stress symptoms: an integrated model

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Workplace bullying refers to prolonged exposure to frequent hostile behaviors at work, which can lead to severe stress reactions. Research in this area has not revealed a clear picture on how bullying escalates in organizations. Drawing on recent developments in work stress theory, this study tested a comprehensive model of bullying in which work environmental and personality factors were hypothesized to act as antecedents of bullying and post-traumatic stress symptoms as an outcome. Structural equation modeling on data provided by 609 public sector employees in Italy showed that job demands (workload and role conflict) and job resources (decision authority, co-worker support and salary/promotion prospects) were related to bullying over and above neuroticism, and that bullying mediated the relationship between job demands and PTSD symptoms. Evidence also emerged for a buffering effect of job resources on the job demands–bullying relationship. Overall results are compatible with a view of bullying as a strain phenomenon, initiated by both work environmental and personality factors.

Keywords: workplace bullying; victimization; PTSD symptoms; job demands-resources model; bullying model; neuroticism

The phenomenon of workplace bullying, first described by Leymann (e.g., 1996), refers to prolonged exposure to frequent hostile behaviors at work, such as excessive criticism of one's work, withholding of information which affects performance, spreading of rumours, social isolation, etc. (Einarsen, Hoel, Zapf, & Cooper, 2010). In the long run these behaviors may lead to the stigmatisation and victimization of the exposed individual (Einarsen & Mikkelsen, 2003).

Despite important advancements in terms of refinement of the construct and understanding of the individual effects of the phenomenon, workplace bullying is still a topic in which there is a need for further research (Bowling & Beehr, 2006). This is because research on the antecedents of bullying and on the effect of possible preventive interventions is still in its infancy. Thus, in the present study we contribute to research in this area by developing and testing an overall model of bullying which presents the following three unique features: it integrates work environmental and

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personality factors as potential preconditions of bullying; it includes not only traditional job stressors but also buffering resources; and it examines post-traumatic stress disorder (PTSD; American Psychiatric Association [APA], 2000) symptomatology as a possible consequence of the bullying-related victimization.

Development of bullying: the role of work environmental and personality factors

Most research on the development of bullying has examined either the role of the work environment (see Salin & Hoel, 2010) or the role of the characteristics of the victim (see Zapf & Einarsen, 2010). According to the work environment hypothesis (e.g., Leymann, 1996), poor psychosocial conditions at work (e.g. role ambiguity and role conflict) may trigger interpersonal conflicts, which if not properly managed may escalate into bullying.

However, empirical data on the work environment hypothesis are not conclusive. While research has shown (e.g., Leymann, 1996; Vartia, 1996) that victims of bullying report poor psychosocial work environments (a more competitive social climate, higher workload, less social support, etc.), the systematic investigation of predicting factors and explaining processes of workplace bullying in the light of more robust models of work stress has only recently started up. Agervold and Mikkelsen (2004), in one of the first studies, found that employees who were frequently exposed to bullying reported less job control, work tasks which were more unclear or contradictory, a management style which was less employee-oriented, and fewer social contacts with co-workers. More recently, Skogstad, Einarsen, Torsheim, Aasland and Hetland (2007) found that a *laissez faire* leadership style as well as role conflict and role ambiguity were antecedents of bullying, with role stressors mediating the effect of abdicating leadership on bullying. These findings were corroborated by Hauge, Skogstad, and Einarsen (2007), who found that leadership variables were substantially related to bullying over and above other job stress-inducing factors such as role stressors, job demands and decision authority. In a meta-analysis, Bowling and Beehr (2006) reported that work constraints, role conflict and role ambiguity are the strongest potential antecedents of workplace harassment. In line with these results, on the basis of the analysis of 148 organizational ethnographies, Hodson, Roscigno, and Lopez (2006) concluded that coherent production procedures provide a context in which bullying is unnecessary and disallowed.

However, all of the studies reviewed above on the work environment hypothesis of bullying neglect the role of personality factors. This is an important shortcoming, since there is strong evidence for a relationship between bullying and certain personality traits (Zapf & Einarsen; 2010). Coyne, Smith-Lee Chong, Seigne, and Randll (2003), for example, found that victims of bullying displayed a tendency, in comparison to controls, to be easily upset and were more likely to experience difficulty in coping with personal criticism; they also tended to be more anxious, tense, and suspicious of others. Similar results were reported in a sample of victims who sought clinical advice (Brousse et al., 2008). In this study 88% of the victims reported high trait neuroticism at first consultation, with this percentage remaining statistically unchanged at the one-year follow-up. In a Finnish study of hospital employees, Kivimäki et al. (2003) showed not only that undergoing bullying predicted the incidence of depression, but also that the presence of a diagnosis of

depression predicted the incidence of bullying, suggesting that personal psychological factors may be implicated in bullying. Finally, Bowling, Beehr, Bennett and Watson (2010) recently found a significant longitudinal relationship between negative affectivity – which includes a general proneness to experience anger, fear, sadness, and other negative feelings (Watson & Pennebaker, 1989) – and workplace victimization.

A comprehensive model of bullying

Research on work environmental and personality factors as antecedents of bullying has mostly been parallel in nature. Thus, in the present study we test a model of the experience of bullying and its consequences in which we integrate both types of factors.

To operationalize the effect of the work environment on bullying, we use the framework of a recently introduced model of work stress: the job demands-resources (JD-R) model (e.g. Bakker & Demerouti, 2007). According to the JD-R model, the psychosocial characteristics of the work environment may be differentiated into two overarching factors: job demands and job resources. Job demands refer to aspects of the job (e.g. physical and psychological demands) that require physical or mental effort and that therefore may generate work-related stress, thus acting as a potential triggering factor for interpersonal conflicts and bullying. Job resources, on the other hand, are those aspects (e.g. decision latitude and social support) that are functional in reaching work goals and/or in reducing job demands and that may protect individual health and promote well-being. Therefore, job resources may be hypothesized as acting as a buffering factor in the escalation of bullying, which would be consistent with the widely known buffering hypothesis.

As far as personality is concerned, we focus on neuroticism, which has been found to be a potentially important factor in bullying (e.g. Coyne et al., 2003). However, of particular interest to unravel the process of bullying escalation is to look at whether neuroticism strengthens the job demands–bullying relationship. This would be in line with the idea of a differential reactivity to environmental stressors of people with high neuroticism (Warr, 2007), which could increase their risk of becoming victims of bullying. Different mechanisms may explain the strengthening effect of neuroticism on the job demands–bullying relationship (Bowling et al., 2010). For example, under distressing working conditions highly neurotic employees may engage more often in annoying behaviors, which could lead potential perpetrators to bully them.

A final aspect of novelty of the proposed model of bullying is that PTSD symptoms are examined as a possible consequence of the phenomenon. Although it is a matter of debate whether bullying has all the characteristics of an overwhelming traumatic event (Mikkelsen & Einarsen, 2002), which is a prerequisite condition for the diagnosis of PTSD, a number of studies indeed found a relationship between bullying and PTSD symptoms (e.g., Balducci, Alfano, & Fraccaroli, 2009; Mikkelsen & Einarsen, 2002). However, a potential limitation of these studies is that in none of the cases was an organizational sample of participants included. Rather, contacts were made either with victims from anti-bullying associations (Mikkelsen & Einarsen, 2002) or with victims who sought clinical consultation (Balducci et al., 2009). These victims may differ from bullying victims in general (Nielsen & Einarsen,

2008). For example, they may represent only the most extreme cases of bullying, ending with expulsion of the victim from the labour market (Leymann, 1996), which may be the real factor leading to PTSD symptoms. If bullying has indeed traumatic potential, then the relationship between bullying and PTSD symptoms should also emerge in organizational samples, which has never been investigated in previous research. Furthermore, since there is evidence for a relationship between work environmental factors and bullying (Hauge et al., 2007) and between bullying and PTSD symptoms (Balducci et al., 2009), then the hypothesis may also be investigated that bullying acts as a mediator in the relationship between work environmental factors and PTSD symptoms.

On the basis of the above considerations, we thus tested the following hypotheses:

Hypothesis 1: Work environmental factors and neuroticism would be related to the experience of bullying. Specifically, job demands and neuroticism would show a positive relationship with bullying, while job resources a negative relationship with bullying.

Hypothesis 2: Bullying would be positively related to PTSD symptoms.

Hypothesis 3: Job resources would moderate the job demands–bullying relationship.

Hypothesis 4: Neuroticism would strengthen the job demands–bullying relationship.

Hypothesis 5: Bullying would mediate the job demands–PTSD symptoms relationship.

Method

Participants

Data were collected as part of a psychosocial risk assessment conducted in 2007 in a large public administration agency in Italy. Employees in non-managerial positions, most of whom carrying out administrative work, were requested to fill in a structured, anonymous questionnaire investigating a number of psychosocial aspects of work and health outcomes. The questionnaire was administered during working hours; participation was on a voluntary basis. A total of 818 employees participated. The study sample consisted of the 609 participants who had complete data on all study variables. Response rate of the study sample was 43.78%. Gender was female in 49.4% of the cases, which represented fairly well the gender distribution of the organization (49.2% were females). Age of participants was distributed as follows: .5% were 20–29 years, 23.9% were 30–39, 43.0% were 40–49, 28.8% were 50–59 and 3.8% were 60 or more. As for the age distribution in the population, 65% of employees were aged 40 years or above, which indicates that the sample had a certain approximation to the population as far as age is concerned. Most participants (98.3%) had a permanent job contract. Given the sensitive nature of the questionnaire contents, no further demographic or occupational data were collected.

Instruments

Workplace bullying was investigated by using a 9-item version (Notelaers & Einarsen, 2008) of the Negative Acts Questionnaire-Revised (NAQ-R; Einarsen, Hoel, & Notelaers, 2009). The NAQ-R explores how often the respondent has been subjected to a number of negative behaviors at work in the last six months, such as

"Someone withholding information which affects performance." Responses varies from 0 ("Never") to 4 ("Daily"). We obtained a Cronbach's alpha of .82 for the adopted version of the scale. The items of the short NAQ-R explores three 3-item components of bullying (i.e., work-related bullying, person-related bullying and social isolation), which were taken as the observed indicators of the underlying construct. Cronbach's alpha of observed variables used in the analyses is reported in Table 1.

Symptoms of PTSD were explored by using a validated brief version of the PTSD Checklist-civilian scale (PCL-C; Lang & Stein, 2005). This version includes six items forming three 2-item subscales (i.e., re-experiencing, avoidance, and hyper-arousal) which investigate the three types of symptoms of PTSD as defined by the DSM IV-TR (APA, 2000). An example item is "Experienced repeated, disturbing memories, thoughts or images of the traumatic event." Responses to items were in terms of symptoms intensity and varied from 1 ("Not at all") to 5 ("Extremely"). Where the original item was anchored to "the traumatic event," we modified the item by anchoring it to "the negative behaviors" defining bullying. The overall alpha for the scale was .89. In the analyses we used the three 2-item measures defined above as observed indicators of the investigated construct.

As for job demands, previous qualitative interviews conducted by the first author with employees suggested that two common sources of stress were role stressors and work overload. We therefore operationalized job demands in terms of role conflict and workload. Role conflict was measured by using six items (e.g., "I receive incompatible requests from two or more people") from the role conflict scale developed by Rizzo, House, and Lirtzman (1970). Responses ranged from 1 ("Completely true") to 5 ("Completely false"), with items being reverse coded before computing the scale total. Workload was measured by using the five-item Effort scale from the Effort-Reward Imbalance questionnaire (ERI; Siegrist et al., 2004). An example item is "I have constant time pressure due to a heavy workload." Responses on this scale vary from 1 ("Disagree") to 5 ("Agree, and I'm very disturbed by this").

We operationalized job resources in terms of autonomy, promotion prospects, and co-workers support – factors that emerged as important helping elements in the studied organization. These are job resources with potential importance in most work settings (e.g., Warr, 2007). Autonomy was measured by three items forming the decision authority scale of the Job Content Questionnaire (JCQ; Karasek et al., 1998). An example item is "In the organization of my work I have a lot to say." Responses vary on a 4-point scale ranging from 1 ("Strongly disagree") to 4 ("Strongly agree"). Promotion prospects were evaluated by using the Salary/promotion scale from the ERI questionnaire (Siegrist et al., 2004), which is composed of four items such as "Considering all my efforts and achievements, my job promotion prospects are adequate." Responses were given on a 5-point scale ranging from 1 ("Yes") to 5 ("No, and I'm very disturbed by this"). Items were recoded, when necessary, so that higher scores meant higher job promotion prospects. Co-workers support was measured by four items from the JCQ (Karasek et al., 1998). Responses were given on a 4-point scale ranging from 1 ("Strongly disagree") to 4 ("Strongly agree"); an example item is: "My co-workers are friendly with me."

Table 1. Properties and Pearson's product moment correlations of the study variables ($N = 609$).

Variable	*M*	*SD*	α	1	2	3	4	5	6	7	8	9	10	11	12	13
1. NAQ–Work-related bullying	0.50	0.6	.66	–												
2. NAQ–Personal bullying	0.47	0.6	.71	.57**	–											
3. NAQ–Social isolation	0.34	0.5	.58	.60**	.59**	–										
4. PTSD–Re-experiencing	1.47	0.8	.87	.47**	.43**	.46**	–									
5. PTSD–Avoidance	1.67	0.9	.76	.38**	.39**	.44**	.71**	–								
6. PTSD–Hyperarousal	1.50	0.8	.79	.42**	.41**	.42**	.64**	.62**	–							
7. Role conflict	2.40	0.8	.76	.37**	.24**	.27**	.23**	.25**	.28**	–						
8. Workload	1.96	0.7	.84	.26**	.27**	.25**	.30**	.23**	.31**	.34**	–					
9. Salary/promotion prospects	3.31	1.1	.81	−.29**	−.19**	−.26**	−.29**	−.29**	−.26**	−.26**	−.20**	–				
10. Coworker support	2.80	0.3	.73	−.26**	−.27**	−.31**	−.16**	−.20**	−.13**	−.15**	−.12**	.27**	–			
11. Decision authority	2.70	0.5	.69	−.21**	−.17**	−.13**	−.22**	−.17**	−.17**	−.15**	.08*	.24**	.13**	–		
12. Neuroticism	2.08	0.8	.90	.30**	.22**	.28**	.39**	.31**	.41**	.21**	.25**	−.08	−.08	−.15**	–	
13. Gender[a]	–	–	–	.15**	.12**	.02	.04	.11**	.03	.10*	.21**	−.03	−.09*	−.11**	.10*	–

Note: [a]Coded as: 0 = male; 1 = females.
*$p < .05$. **$p < .01$.

Neuroticism was measured by using a 9-item scale (e.g., "I get upset easily") derived from a big-five personality inventory included in the International Personality Item Pool (IPIP; Goldberg, 1999). Responses varied from 1 ("Not at all") to 5 ("Completely").

Analyses

Hypotheses were tested by using structural equation modeling (SEM) as implemented by LISREL 8.71. In order to test for the two hypothesized interactions (job demands × job resources and job demands × neuroticism) on bullying (see Hypothesis 3 and Hypothesis 4), we used moderated structural equation modeling (MSEM; Cortina, Chen, & Dunlap, 2001). More details on MSEM are given below. To test for the postulated mediation model of bullying (Hypothesis 5), we used the Sobel (1986) test.

The fit of the structural equation models was evaluated by using the χ^2 statistic and a variety of other practical fit indices. Models showing values of up to .08 at the Root Mean Square Error of Approximation (RMSEA) and values of .90 or higher at the Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), Comparative Fit Index (CFI), Goodness of Fit Index (GFI) and its adjusted form (AGFI) are usually considered as acceptable (see Tabachnick & Fidell, 2007). Models showing values of up to .06 at the RMSEA and values of .95 or higher at the NFI, NNFI and CFI are considered as good (Hu & Bentler, 1999).

Results

Preliminary analyses

Since the study sample ($N = 609$) was obtained by using listwise deletion of cases from the initial sample ($N = 818$), we preliminarily checked whether the excluded cases differed from the included ones on the three bullying measures (i.e., the crucial study variables). Three *t*-tests did not reveal any difference between the two groups: $t(729) = 1.22$, *ns*, for work-related bullying; $t(727) = 1.13$, *ns*, for person-related bullying; and $t(738) = .44$, *ns*, for social isolation.

Properties of study variables and correlations are reported in Table 1. We also included gender in these analyses since gender has been found to be the strongest predictor of PTSD (Nemeroff et al., 2006). However, gender did not show strong correlations with PTSD symptoms in the present study (see Table 1); thus, we finally decided to leave it out from further analysis.

We then tested whether the joint distribution of observed variables was multivariate normal. Results of these tests revealed that this assumption did not hold – for example, the test for multivariate skewness was statistically significant ($Z = 25.88$; $p < .001$). Thus, to improve parameters' estimation, we run all SEM analyses by using the robust maximum likelihood method (Olsson, Foss, Troye, & Howell, 2000).

Finally, before testing our main hypotheses, we checked for whether the latent factors job demands and job resources could be differentiated empirically. To this end we used confirmatory factor analysis (CFA), comparing the fit of a second order two-factor (job demands and job resources) model to the fit of a second order one-factor (psychosocial risk) model. In the two-factor model the first order factors were

role conflict and workload for job demands, while promotion prospects, co-workers support and autonomy for job resources. In the one-factor model the same first order factors all loaded on a second-order psychosocial risk factor. Observed measures for these preliminary analyses were the following: role conflict, workload, promotion prospects and co-worker support were each indicated by two randomly derived parcels, while autonomy by the three component items. CFA results for the one-factor model were the following: χ^2 (39) = 198.66; GFI = .94; AGFI = .91; RMSEA = .077; NFI = .91; NNFI = .90; CFI = .93. Results for the two-factor model were the following: χ^2 (38) = 139.94; GFI = .96; AGFI = .93; RMSEA = .062; NFI = .94; NNFI = .93; CFI = .95. Satorra and Bentler (2001) scaled χ^2 difference test (S-B $\triangle\chi^2$) indicated that the two-factor model fitted significantly better than the one-factor model, S-B $\triangle\chi^2$ (1) = 44.41, $p < .001$. The estimated correlation between the second-order job demands and job resources factors was $\varphi = -.41$. On the whole, the data supported the differentiation of a latent job demands factor from a latent job resources factor.

Test of main hypotheses

MSEM was implemented by using the technique outlined by Mathieu, Tannenbaum, and Salas (1992) as reported in Cortina et al. (2001). In this analyses, job demands, job resources, neuroticism and each of the successive interactions tested (job demands × job resources and job demands × neuroticism) had only one observed indicator. The indicator for job demands, job resources and neuroticism was obtained by summing and standardizing (i.e., centering) the scores on the variables involved in the definition of the factor. The indicator of the interaction factor was the product of the two scores of the indicators defining the interacting factors. The path from each of the factors to its indicator was fixed by using the square root of the reliability of the indicator. The reliabilities of the job demands, job resources, and neuroticism indicators were estimated by means of their Cronbach's alpha. The reliability of the indicator for the interaction factor was computed by taking the product of the reliabilities of the interacting factors' indicators (e.g., job demands and job resources) plus the square of the latent correlation between the same factors, divided by one plus the square of the same latent correlation just mentioned (Cortina et al., 2001). The error variance of the observed indicator for each factor was set equal to the product of its variance and one minus its reliability. The correlation between each of the two interacting factors and the factor representing their interaction was fixed at zero (Cortina et al., 2001). A significant interaction effect is supported when the path coefficient from the latent interaction factor to the latent target factor is statistically significant and the model including this path fits significantly better, as evaluated by a difference in the χ^2 statistic, than the model which does not include this same path.

Thus, each MSEM analysis included six factors: job demands, job resources, neuroticism, the focused interaction, bullying, and PTSD symptoms, with each of the latter two factors being defined by its three observed indicators (see Method section). The tested models were in line with the proposed hypotheses, such that job demands, job resources, neuroticism and each of the interaction factors tested were all related to bullying, while bullying was related to PTSD symptoms. We also included a direct relationship between neuroticism and PTSD symptoms in the model; this is because

neuroticism has been found to be related to the experience and onset of anxiety symptoms and disorders (Clark, Watson, & Mineka, 1994). Table 2, Models 1–2, reports the results of MSEM testing for Hypotheses 1–3 that work environmental factors (i.e., job demands and job resources) and neuroticism would be related to bullying, that bullying would be related to PTSD symptoms, and that job resources would moderate the job demands–bullying relationship, respectively.

A comparison between Model 1 and Model 2, which differed for the inclusion in Model 2 of a direct path from the interaction factor to the bullying factor, indicated that the difference in their χ^2 value was statistically significant (S-B $\Delta\chi^2_{M1-M2}$ (1) = 3.96; $p < .05$). Model 2 is graphically represented in Figure 1, from where it can be seen that job demands ($\gamma = .30$; $p < .05$), job resources ($\gamma = -.36$; $p < .05$), and neuroticism ($\gamma = .22$; $p < .05$) were all related to bullying in the expected direction and that bullying was strongly positively related to PTSD symptoms ($\gamma = .61$; $p < .05$). Thus, we found evidence in line with Hypothesis 1 and Hypothesis 2. Furthermore, the interaction (job demands × job resources) factor showed also a modest but significant negative relationship with bullying ($\gamma = -.13$; $p < .05$), with simple slope analysis (Figure 2) indicating that at higher levels of job resources the job demands–bullying relationship was weaker. Thus, we also found evidence in line with Hypothesis 3.

Table 2, Models 3–4, reports the results of MSEM testing for Hypotheses 4 that neuroticism would strengthen the job demands–bullying relationship. A comparison between Model 3 and Model 4, which differed for the inclusion in Model 4 of a path from the job demands × neuroticism interaction factor to the bullying factor, indicated that their fit was not significantly different. Thus we did not find evidence in line with Hypothesis 4.

To look at whether bullying would mediate the relationship between job demands and PTSD symptoms (Hypothesis 5), we focused on Model 2 (see Figure 1) and used

Table 2. Results of SEM analyses.

Model	χ^2	df	GFI	AGFI	RMSEA	NFI	NNFI	CFI
Model 1 (JD × JR interaction on bullying: main effects only)	58.769**	30	.970	.944	.039 (.023–.054)	.985	.989	.993
Model 2 (JD × JR interaction on bullying: main and interaction effects)	54.734**	29	.972	.946	.038 (.022–.053)	.987	.990	.994
Model 3 (JD × neuroticism interaction on bullying: main effects only)	55.837**	30	.971	.946	.038 (.022–.053)	.985	.990	.993
Model 4 (JD × neuroticism interaction on bullying: main and interaction effects)	55.925**	29	.971	.945	.039 (.023–.054)	.985	.989	.992

Note: JD, job demands; JR, job resources; GFI, goodness of fit index; AGFI, adjusted goodness of fit index; RMSEA, root mean square error of approximation; NFI, normed fit index; NNFI, non-normed fit index; CFI, comparative fit index.
**$p < .01$.

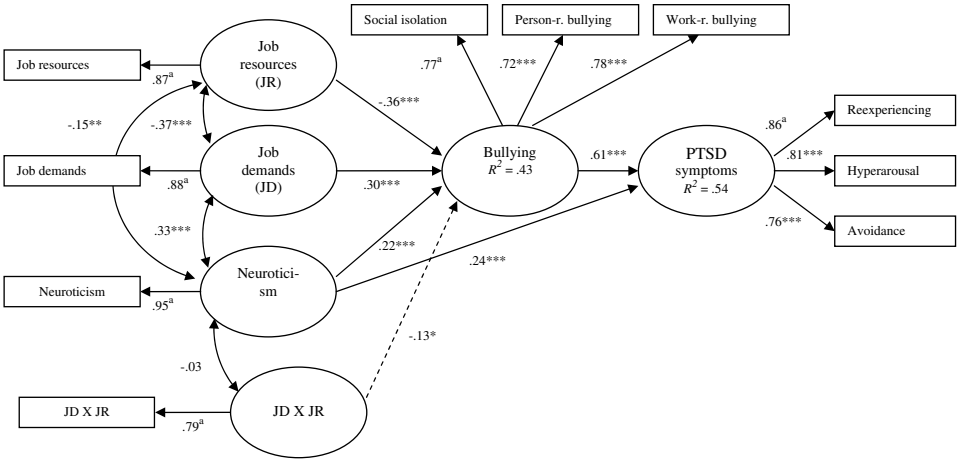

Figure 1. Moderation of job resources on the relationship between job demands and workplace bullying.
Note: Person-r. bullying, Person-related bullying; Work-r bullying, Work-related bullying. Reported paths are standardized parameter estimates.
[a]This parameter is fixed in the model, so no *p*-value is available.
$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

the Sobel (1986) test on appropriate unstandardized coefficients. Results indicated that bullying indeed mediated the relationship between job demands and PTSD symptoms ($Z = 4.32$; $p < .05$), which was in line with Hypothesis 5. To increase our confidence on the latter result, we also ran bootstrap analysis, which – differently from the Sobel test – does not rely on the assumption of a normal sampling distribution (Preacher & Hayes, 2008). To this end we obtained appropriate factor scores from Model 2 in LISREL and sent them to the SPSS macro developed by Preacher and Hayes (2008). Results (reported as unstandardized coefficients) indicated that the total effect of job demands on PTSD symptoms (total effect = .60, $t = 10.31$; $p < .01$) became nonsignificant when bullying was included in the

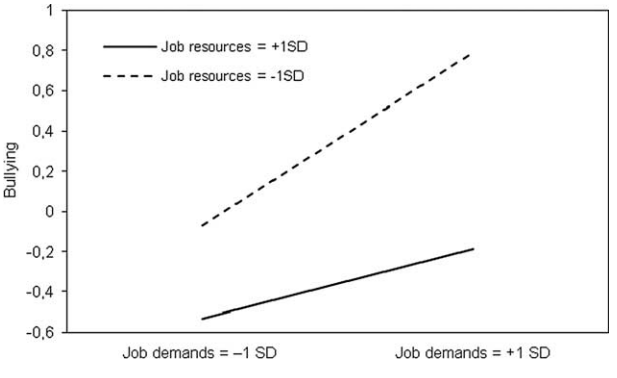

Figure 2. Simple slope analysis for the moderation of job resources on the relationship between job demands and workplace bullying.

model (direct effect of job demands = .07, $t = 1.36$; *ns*). Furthermore, the analyses revealed that the indirect effect of job demands on PTSD symptoms (i.e., the difference between the total and direct effects) was significant, with a point estimate of .50 and a 95% BCa (bias-corrected and accelerated) bootstrap confidence interval of .41 to .60.

Discussion

The current study was designed with the main purpose of testing a comprehensive model of bullying including three unique aspects, namely the consideration of work environmental and personality factors; examination of both traditional stressors and buffering resources; and the inclusion of PTSD symptoms as a possible consequence of bullying-related victimization.

We found that personality and work–environmental factors were independently related to bullying, suggesting two possible different paths to the workplace victimization. As far as personality is concerned, building on previous research (e.g., Bowling et al., 2010) we focused on neuroticism and found that the higher the level of this disposition, of which one of the main characteristics is emotional instability (Warr, 2007), the higher the frequency of the reported bullying. Thus, independently of the characteristics of the work environment, neuroticism may directly contribute to bullying. For example, neurotic individuals may behave in such a way to actively produce conflicts that may cause them to be aggressed by others (Zapf & Einarsen, 2010).

However, the results of the present study strongly suggest that personality is not a sufficient factor for an understanding of bullying. A reformulation and test of the work environment hypothesis (Hauge et al., 2007) according to the principles of the job demands–resources model of work stress (Bakker & Demerouti, 2007) supported the view that psychosocial characteristics of the job (i.e., job demands and job resources) are directly related to bullying over and above neuroticism. According to the job demands–resources model, job demands have the potential to activate negative arousing experiences at work and may, in the longer run, induce health impairment process (Schaufeli, Bakker, & Van Rhenen, 2009). Workplace bullying could be an interpersonal correlate of this process, in that negative arousing experiences at work and stress reactions may predispose individuals to involvement in interpersonal conflicts which may then escalate into bullying. In line with this interpretation, we also found that a job resources factor made up of promotion prospects, co-worker support and autonomy was negatively related to bullying and buffered the job demands–bullying relationship. This is to be expected, since the investigated resources provide protection from the arousing effect of job stressors and thus prevent individuals' experiencing the hypothesized preconditions of bullying. Overall these results further support the view of bullying as a strain phenomenon.

We also found that bullying was strongly related to PTSD symptoms and that bullying mediated the job demands–PTSD symptoms relationship. These findings are original for two reasons. First of all because previous studies on the relationship between bullying and PTSD symptoms (e.g., Balducci et al., 2009) only focused on non-organizational samples (usually clinical samples) of victims. Secondly, a model including a path from working conditions to bullying and from bullying to PTSD

symptoms, where bullying plays a mediating role, has not been previously explored. Our analyses provided evidence for this path, and thus for the plausibility of Leymann's (1996) idea that interpersonal conflicts at work that are related to poor working conditions may lead to bullying, and from bullying to traumatic stress reactions.

Of course we cannot resolve the complex issue of the appropriateness of PTSD diagnosis as a consequence of bullying, which is related to the conceptualization of bullying as an overwhelming traumatic event. However, bullying seems to have indeed the potential for being a traumatic event (Mikkelsen & Einarsen, 2002). To further investigate this issue in our data, in separate analyses (not reported here) we tried to control for participants' exposure to other traumatic events. Specifically, on the basis of an item included in the questionnaire, we split our sample into two subgroups, differentiating workers who over the last year experienced ($n = 117$) versus did not experience ($n = 476$) a traumatic event (e.g., death of the spouse, severe personal illness, divorce) scoring higher than 50 on the Social Readjustment Rating Scale (Holmes & Rahe, 1967) – and refitted our final model of bullying (see Figure 1) on the latter subgroup. Bullying was still strongly related to PTSD symptoms and played a mediating role on the job demands–PTSD symptoms relationship. These results provide further evidence for the traumatic potential of bullying, which perhaps is related to its repetitive nature and prolonged duration.

Study limitations and implications

The most important limitation of our study is that it was based on a cross-sectional design. Longitudinal studies in the work stress area (e.g., De Raeve, Jansen, van den Brandt, Vasse, & Kant, 2008; Schaufeli, Bakker, & Van Rhenen, 2009) do show that organizational factors such as role conflict and role ambiguity have an influence on interpersonal conflicts and health outcomes, so the path from job demands to PTSD symptoms through bullying is plausible. However, there is a strong need for more longitudinal research in this area.

A second limitation is that the data were self-reported, which raises the issue of common method variance. However, other methods, such as observer ratings of working conditions, may be equally affected by bias (Spector, 2006). For example, peer nominations of bullying as used by Coyne et al. (2003) may only capture bullying behaviors that are overt in nature, which may be the minority. Furthermore, by including neuroticism (i.e., negative affectivity) in our model, we considered a crucial source of common method bias (Watson & Pennebaker, 1989).

A third important limitation of the present study is its lack of generalizability. We have focused on employees of a public administration agency in Italy. So it is to be seen in future research whether the present findings generalize to other types of jobs and occupational sectors.

As far as implications are concerned, the results of the present study suggest that management interventions aiming at controlling critical job demands and reinforcing job resources seem to be useful means for avoiding interpersonal conflicts and bullying (see also De Raeve et al., 2008) and their extreme consequences. Furthermore, training employees on conflict management may also be useful, particularly for those with high potential to become targets of bullying.

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